

# FAST FACTS SULFURIC ACID

## Missouri Department of Health and Senior Services Hazardous Substance Emergency Events Surveillance (HSEES) Program

**Synonyms:** Spirit of sulfur  
Hydrogen sulfate

**CAS Number:** 7664-93-9

**DOT Numbers:** UN1830  
UN1831 (fuming)  
UN1832 (spent)

**DOT Designation:** Corrosive material

Hazard Rating	NFPA
HEALTH	3
FLAMMABILITY	0
REACTIVITY	2
<ul style="list-style-type: none"><li>Corrosive and reactive</li><li>Do not use water – poisonous gases are produced in fire or on contact with water or steam</li></ul>	

*Hazard Rating Key:*  
0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

### Exposure Levels

- Short-term exposure may cause irritation of the nose and throat at levels of 5 mg/m<sup>3</sup>\* if inhaled. Swelling of the throat and lungs and inflammation of the bronchial membranes may occur at levels of 12-35 mg/m<sup>3</sup>. A few drops in the lung air passages may be fatal.
- Very small quantities of sulfuric acid may cause severe burns, irritation and ulceration of the skin.
- If ingested, sulfuric acid may cause damage to teeth, burning of the mouth, throat and stomach, nausea, vomiting of blood and eroded tissue, holes in the stomach and intestines, shock and kidney damage. Death may occur from as little as one ounce.

### Characteristics and Potential Exposures

Sulfuric acid is an oily liquid. It is used as a chemical feedstock in the manufacture of acetic acid, hydrochloric acid, citric acid, phosphoric acid, aluminum sulfate, ammonium sulfate, barium sulfate, copper sulfate, phenol, superphosphates and titanium dioxide. It is also used in the manufacture of synthetic fertilizers, nitrate explosives, artificial fibers, dyes, pharmaceuticals, detergents, glue, paint, and as an electrolyte in storage batteries, for the hydrolysis of cellulose to obtain glucose, in the refining of mineral and vegetable oil, and in the

leather industry. Other uses include fur and food processing, carbonization of wool fabrics, gas drying, uranium extraction from pitchblende and laboratory analysis.

### Sulfuric Acid Releases in Missouri

During calendar years 1994-1998, 1,071 HSEES events were reported in Missouri. Of those, 48 events involved sulfuric acid. Quantities released ranged from 32 ounces to 3,000 gallons, and from 1 to 2,370 pounds. Fixed facilities were involved in 33 of these events, while 15 occurred during transport. Four people sustained injuries during four events. Two events resulted in the evacuation of 120 people.

### Interesting Event

Seventeen postal workers at a metropolitan mail handling facility were transported to a hospital for observation after a package containing sulfuric acid began leaking. The acid was released from one of six bottles of sulfuric acid being sent through the mail. It is estimated that 32 ounces of sulfuric acid were released as the package traveled on a conveyor belt. Approximately 120 employees were evacuated from the facility, and were allowed to return to their jobs four hours later after a HAZMAT team cleaned up the spill. The acid had been improperly packaged.

### Health Hazard Information

- Sulfuric acid can severely irritate and burn the skin and eyes, causing third-degree burns and blindness on contact.
- Breathing sulfuric acid can irritate the lungs, causing coughing and/or shortness of breath. Higher exposures can cause a build-up of fluid in the lungs (pulmonary edema), with severe shortness of breath.

### Personal Protective Equipment Guidelines

- Appropriate protective clothing should be worn to prevent any possible skin contact with liquids of >1.0% content, or repeated or prolonged contact with liquids <1.0% content.
- Wear eye protection to avoid any possibility of eye contact, unless full facepiece respiratory protection is worn.
- Whenever the potential exists for exposures over 1 mg/m<sup>3</sup>, use a National Institute for Occupational Safety and Health (NIOSH) approved full facepiece respirator with an acid

\* mg/m<sup>3</sup> means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

gas canister and high efficiency particulate prefilters. Increased protection is obtained from full facepiece powered-air purifying respirators.

### Handling and Storage

- Avoid contact with water, cyclopentadiene, cyclopenta-none oxime, nitroaryl amines, hexalithium disilicide, and phosphorus III oxides since violent reactions can occur.
- Sulfuric acid is not compatible with chlorates, chromates, carbides, fulminates, nitrates, picrates, cyanides, halides and powdered metals.
- Store sulfuric acid in tightly closed containers in a cool, well-ventilated area away from sunlight, combustibles and organic materials in an area with an acid resistant cement floor.
- Always add acid to water, never the reverse.
- Contact of sulfuric acid with metal drums may cause the release of flammable and explosive hydrogen gas; therefore, storage drums should be coated with acid resistant material.
- Sources of ignition such as smoking and open flames are prohibited where sulfuric acid is used, handled, or stored in a manner that could create a potential fire or explosion hazard.
- Use explosion-proof electrical equipment and fittings wherever sulfuric acid is handled or stored.

### Spills and Emergencies

- Most environmental emergencies involve spills of hazardous materials that must be reported to the Department of Natural Resources through a 24-hour hotline (573-634-2436). When reporting a spill, callers can also obtain technical assistance regarding response, containment and cleanup of hazardous materials.
- Restrict persons not wearing protective equipment from areas of spills or leaks until cleanup is complete.
- Stay upwind; keep out of low areas.
- Keep all sources of ignition away from containers because explosive mixtures of hydrogen may be produced.
- Cover spills with dry sand, soda ash or cement powder. Do not use organic materials such as sawdust, and do not wash down a spill of sulfuric acid with water. Other neutralizing agents are calcinated dolomite, calcium oxide and hydroxide, and sodium carbonate.
- Do not touch spilled material.
- Use water spray to reduce vapor; do not get water inside the container.
- Shovel neutralized residues into containers for disposal, or cover area with sand or earth and shovel into disposal containers.
- Ventilate and wash the area after clean up is complete.

### Disposal Methods

Add slowly to a solution of soda ash and slaked lime while stirring; flush to drain with large volumes of water. Recovery and reuse of spent sulfuric acid may be a viable alternative to disposal.

### Fire Extinguishing

Use carbon dioxide or dry chemical. Use water on combustibles burning in the vicinity of sulfuric acid, but use extreme care. Water applied directly to sulfuric acid results in the generation of heat and causes splattering.

### Emergency First Aid Measures

#### Eye Contact

- Immediately flush with large amounts of water. Continue for at least 30 minutes, occasionally lifting upper and lower lids. Seek medical attention immediately.

#### Skin Contact

- Quickly remove contaminated clothing. Immediately wash skin with large amounts of water. Seek medical attention immediately.

#### Respiratory

- Remove the victim from the site of the release.
- Begin rescue breathing if breathing has stopped, and CPR if heart activity has stopped.
- Transfer the victim promptly to a medical facility. Medical observation is recommended for 24 to 48 hours after overexposure, as fluid in the lungs may be delayed.

#### Ingestion

- Seek medical attention immediately. Give large quantities of water and do not induce vomiting.



**For more information on the Missouri HSEES program, visit the web site at [www.dhss.state.mo.us/hsees](http://www.dhss.state.mo.us/hsees) or contact the HSEES Coordinator at 573-526-1686.**



*Information for this fact sheet was obtained from the Missouri HSEES Program Five-Year Data Analysis; the Environmental Protection Agency (EPA); the Agency for Toxic Substances and Disease Registry (ATSDR); and the Handbook of Toxic and Hazardous Chemicals and Carcinogens, Third Edition.*

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**THIS FACT SHEET DOES NOT REPLACE THE MATERIAL SAFETY DATA SHEET (MSDS) REQUIRED FOR A HAZARDOUS CHEMICAL UNDER THE OCCUPATIONAL HEALTH AND SAFETY ACT OF 1970 (29 U.S.C. 651 ET SEQ.) AND REGULATIONS PROMULGATED UNDER THIS ACT.**